



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,100	09/19/2006	Shuichiro Saito	03500.109718.	4066
5514 7590 07/02/2010 FITZPATRICK CELLA HARPER & SCINTO 1290 Avenue of the Americas NEW YORK, NY 10104-3800				
EXAMINER ALEJANDRO, RAYMOND				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
07/02/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/599,100

**Applicant(s)**

SAITO, SHUICHIRO

**Examiner**

Raymond Alejandro

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

This office action is responsive to the amendment filed 06/18/10. The applicant has overcome the objections, most of the 35 USC 112 rejections, and the rejections under Section 102. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments and remarks. However, the present claims (new claims 10-17 as original claims 1-9 were cancelled) are finally rejected over new grounds of rejection as composed hereinbelow and for the reasons of record:

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: (in claims 10 and 14) "wherein an operating portion of a pin of the fuel introduction valve, an operating portion of the purge valve and an operating portion of the fuel supply valve, which are provided at outside of the flow passage, are operated...". Applicant has not specifically pointed out where the new or amended claim limitation (i.e. *operating portions of respective valves*) is

supported, nor does there appear to be a written description of the aforementioned claim limitation in the application as filed. That is to say, the newly claimed subject matter is not adequately described in the original disclosure. There is simply no descriptive basis in the as-filed specification to relate a particular feature, element, location, member, connection to respective operating portions of the fuel introduction valve, the purge valve and/or the fuel supply valve in a clear, structured and concrete manner within the context of the claimed invention.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

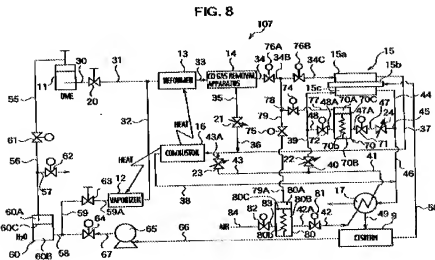
5. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable Sato et al 2004/0062961 in view of: A) Ueda et al 2004/0013919 and/or B) the publication JP 2002-373682 (herein called JP'682).

As to claims 10-11:

**FIGURES 8-13** of Sato et al fairly describe or suggest the present claims as they all read on applicant's vaguely defined fuel supply device.

By way of example, **FIGURE 8** is discussed herein. There is disclosed a fuel cell system encompassing a fuel tank 11 configured to store a fuel; and a vaporizer configured to vaporize the fuel (*if the fuel is liquid which is then vaporized i.e. made gaseous*) (0008, 0024, 0027, 0028). The fuel supplied to the fuel cell can be natural gas, propane gas, among others (0005). A downstream side of the fuel tank 11 includes a variable conductance **valve 20** which can adjust conductance by adjusting the flow (0025). Fuel passes through pipes 31, 34, 34b-c (the flow passage) to the fuel electrode 15a of the fuel cell unit (0025). In fuel flow lines (pipes) 21, 34, 34b-c, there are also provided variable conductance **valves 76A-B, 75, 74** which are open/closed (controlled) according to sensed parameters such as saturated vapor pressure (0072) so as to supplied hydrogen gas to the fuel cell (0072). *Thus, in this case, FIGURE 8 of Sato et al is deemed to read on applicant's invention as it includes a fuel supply device or fuel distribution system including a plurality of valves providing the same structural arrangement and functionality: a) introducing fuel into the pipe 31 (valve 20); purging undesirable gases (valve 75); supplying fuel gas flowing in pipe 34, 34b-c (valve 76A); and supplying fuel to the fuel cell unit (valve 76B). Since the valves are responsive to both the saturated pressure and conductance, they all meet the requirement of being controlled by external mechanical/electrical factors (i.e.*

*pressure and conductance) associated with the fuel cell unit integrated/incorporated/mounted into a fuel cell system including additional system elements or sub-assemblies. Note that in this instance the fuel cell system in which the fuel cell unit is integrated/incorporated into has been taken to represent the external apparatus, and/or any other component of the fuel cell system including the reformer, the gas removal apparatus, the combustor, the vaporizer, the cistern and the likes as applicant's external apparatus is not defined by the claims. This applies equally to the embodiments shown in FIGURES 9-13.*



As to claims 12-13:

Sato et al disclose a fuel cell unit 15 integrated/incorporated/mounted into a fuel cell system/apparatus 107 (FIGURES 8-13, 0068, 0008, 0024); and tank 11 which have the ability of being removed from the system (i.e. detachable) if necessary. Note that the present claims do not define the specific structure of cartridge and the apparatus.

Sato et al discusses a fuel supply device associated with a fuel cell apparatus as described above. However, the preceding reference does not expressly disclose the specific purge valve.

As to claim 10:

A) **Ueda et al** discloses that it is known in the art to have a fuel supply system for a fuel cell comprising a hydrogen purge control apparatus including a purge valve 6 placed in the hydrogen gas circulating flow path capable of purging/discharging unreacted and exhausted gas (*reading on any gas other than the fuel gas introduced*) in a controlled/regulated fashion for optimizing the operating state of the fuel cell stack and the hydrogen concentration of the gas to be reacted (0038, 0040, 0044, Abstract; FIGURES 1 and 10). Ueda et al describe the functionality of the purge valve (0038, 0040, 0044).

B) **JP'682** discloses that it is known in the art to have a fuel supply system for a fuel cell comprising a purge valve disposed in a hydrogen off-gas recovery line as a passage of gaseous hydrogen discharged (*reading on any gas other than the fuel gas introduced*) from the fuel cell and adapted to open according to a differential pressure between both electrodes to release the pressure of the hydrogen off-gas (Abstract, 0016-0018, 0025-0027/ Figures 1, 3 and 5). JP'682 describes the functionality of the purge valve (Abstract, 0016-0018 & 0025-0027). The use of the purge valve disclosed by JP'682 assists in ensuring adequate pressure control in the fuel cell system (Abstract).

By compounding the above teachings, it would have been obvious to a person possessing a level of ordinary skill in the art at the time the invention was made to incorporate into/use the specific purge valves of Ueda et al and/or JP'682 in the fuel cell systems of Sato et al in order to control fuel gas pressure/concentration/discharge rate of supplied gas, and to enhance and optimize the operating state of the fuel cell stack; and/or assists in ensuring adequate pressure control in the fuel cell system. Hence, both of Ueda et al and JP'682 directly conceptualize the

use of purge valves in fuel supply systems for fuel cell apparatus, and their beneficial effects on providing a controlled/regulated discharge of unwanted gas as part of the fuel supply/distribution system regardless of their particular placement within the fuel cell system.

6. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable Sato et al 2004/0062961 in view of Sonoda et al 2004/0232373 and further in view of: A) Ueda et al 2004/0013919 and/or B) the publication JP 2002-373682 (herein called JP'682).

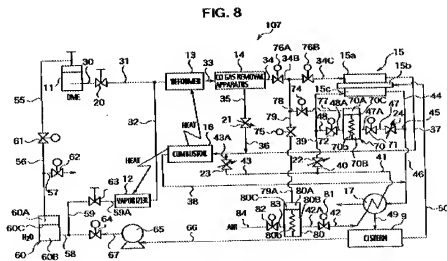
As to claims 14-15:

**FIGURES 8-13** of Sato et al fairly describe or suggest the present claims as they all read on applicant's vaguely defined fuel supply device.

By way of example, **FIGURE 8** is discussed herein. There is disclosed a fuel cell system encompassing a fuel tank 11 configured to store a fuel; and a vaporizer configured to vaporize the fuel (*if the fuel is liquid which is then vaporized i.e. made gaseous*) (0008, 0024, 0027, 0028). The fuel supplied to the fuel cell can be natural gas, propane gas, among others (0005). A downstream side of the fuel tank 11 includes a variable conductance **valve 20** which can adjust conductance by adjusting the flow (0025). Fuel passes through pipes 31, 34, 34b-c (the flow passage) to the fuel electrode 15a of the fuel cell unit (0025). In fuel flow lines (pipes) 21, 34, 34b-c, there are also provided variable conductance **valves 76A-B, 75, 74** which are open/closed (controlled) according to sensed parameters such as saturated vapor pressure (0072) so as to supplied hydrogen gas to the fuel cell (0072). *Thus, in this case, FIGURE 8 of Sato et al is deemed to read on applicant's invention as it includes a fuel supply device or fuel distribution system including a plurality of valves providing the same structural arrangement and*



functionality: a) introducing fuel into the pipe 31 (valve 20); purging undesirable gases (valve 75); supplying fuel gas flowing in pipe 34, 34b-c (valve 76A); and supplying fuel to the fuel cell unit (valve 76B). Since the valves are responsive to both the saturated pressure and conductance, they all meet the requirement of being controlled by external mechanical/electrical factors (i.e. pressure and conductance) associated with the fuel cell unit integrated/incorporated/mounted into a fuel cell system including additional system elements or sub-assemblies. Note that in this instance the fuel cell system in which the fuel cell unit is integrated/incorporated into has been taken to represent the external apparatus, and/or any other component of the fuel cell system including the reformer, the gas removal apparatus, the combustor, the vaporizer, the cistern and the likes as applicant's external apparatus is not defined by the claims. This applies equally to the embodiments shown in FIGURES 9-13.



As to claims 16-17:

Sato et al disclose a fuel cell unit 15 integrated/incorporated/mounted into a fuel cell system/apparatus 107 (FIGURES 8-13, 0068, 0008, 0024); and tank 11 which have the ability of

being removed from the system (i.e. detachable) if necessary. Note that the present claims do not define the specific structure of cartridge and the apparatus.

Sato et al discusses a fuel supply device associated with a fuel cell apparatus as described above. However, the preceding reference does not expressly disclose the diaphragm/valve to control the pressure of the fuel gas.

As to claim 14:

Sonoda et al discuss that it is known in the art to employ a valve for a fuel cell which is capable of reducing (controlling) pressure by using a diaphragm disposed in the valve so as to increase the durability of the valve structure or valving system (0009/Abstract).

By compounding the above teachings, it would have been obvious to a person possessing a level of ordinary skill in the art at the time the invention was made to incorporate into/use the diaphragm/valve of Sonoda et al in the fuel cell systems of Sato et al in order to control fuel gas pressure/fuel supply and to increase the durability of the valve structure or valving system. Thus, Sonoda et al conceptualize that it is beneficial to use a diaphragm for controlling fuel gas pressure.

Moreover, none of the preceding references expressly disclose the specific purge valve.

As to claim 14:

A) However, **Ueda et al** discloses that it is known in the art to have a fuel supply system for a fuel cell comprising a hydrogen purge control apparatus including a purge valve 6 placed in the hydrogen gas circulating flow path capable of purging/discharging unreacted and exhausted gas (*reading on any gas other than the fuel gas introduced*) in a controlled/regulated fashion for optimizing the operating state of the fuel cell stack and the hydrogen concentration of the gas to

be reacted (0038, 0040, 0044, Abstract; FIGURES 1 and 10). Ueda et al describe the functionality of the purge valve (0038, 0040, 0044).

B) also **JP'682** discloses that it is known in the art to have a fuel supply system for a fuel cell comprising a purge valve disposed in a hydrogen off-gas recovery line as a passage of gaseous hydrogen discharged (*reading on any gas other than the fuel gas introduced*) from the fuel cell and adapted to open according to a differential pressure between both electrodes to release the pressure of the hydrogen off-gas (Abstract, 0016-0018, 0025-0027/ Figures 1, 3 and 5). JP'682 describes the functionality of the purge valve (Abstract, 0016-0018 & 0025-0027). The use of the purge valve disclosed by JP'682 assists in ensuring adequate pressure control in the fuel cell system (Abstract).

By compounding the above teachings, it would have been obvious to a person possessing a level of ordinary skill in the art at the time the invention was made to incorporate into/use the specific purge valves of Ueda et al and/or JP'682 in the fuel cell systems of Sato et al and Sonoda et al in order to control fuel gas pressure/concentration/discharge rate of supplied gas, and to enhance and optimize the operating state of the fuel cell stack; and/or assists in ensuring adequate pressure control in the fuel cell system. Hence, both of Ueda et al and JP'682 directly conceptualize the use of purge valves in fuel supply systems for fuel cell apparatus, and their beneficial effects on providing a controlled/regulated discharge of unwanted gas as part of the fuel supply/distribution system regardless of their particular placement within the fuel cell system.

***Response to Arguments***

7. Applicant's arguments with respect to new claims 10-17 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond Alejandro/  
Primary Examiner, Art Unit 1795